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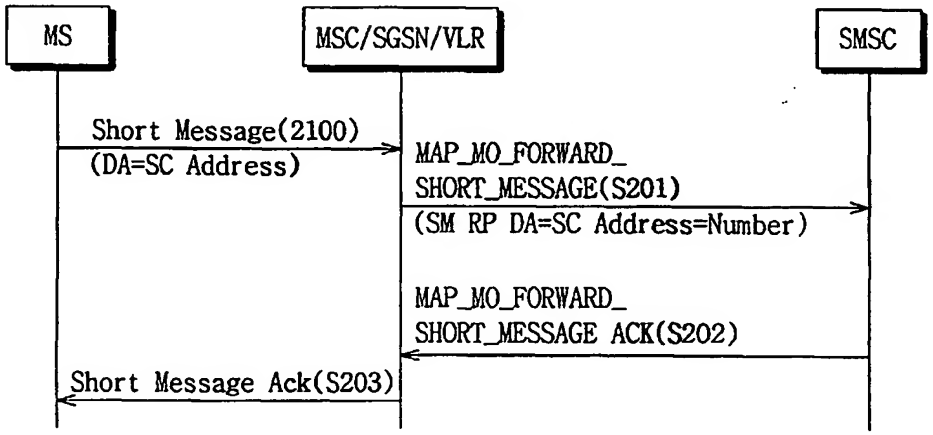
(54) Title: METHOD FOR PROCESSING ADDRESS OF SHORT MESSAGE SERVICE CENTER IN IMT-2000 ASYNCHRONOUS NETWORK



(57) Abstract: The present invention relates to a method for processing an address of a short message service center in a WCDMA network, including: a load centralization confirmation step where an operation control unit receives short message processing states from each short message service center, confirms load centralization states of each short message service center, and generates an operation message; a path setup step where a mobile switching center receives a short message from a mobile station, and sets up a transmission path of the short message according to the operation message; and an optimal transmission step where the mobile switching center transmits the short message from the mobile station to the corresponding short message service center through the transmission path according to the result of the path setup step. When a lot of messages are centralized to a specific short message service center due to call habits of subscribers, some subscribers of the short message service center are distributed to another short message service center, and thus service center reception ability is predictable. It is also possible to actively cope with civil appeals and troubles.

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METHOD FOR PROCESSING ADDRESS OF SHORT MESSAGE SERVICE CENTER IN IMT-2000 ASYNCHRONOUS NETWORK

Technical Field

The present invention relates to a method for processing an address of a short message service center in an IMT-2000 asynchronous network which uses a mobile station ISDN (MSIDSN) as a short message service center address stored in a mobile station defined in 3GPP for routing and subscriber distribution of the short message service center in an UMTS (Universal Mobile Telecommunication Service) network, instead of using a real short message service center address.

Background Art

In general, in 3GPP, when an MS (Mobile Station) transmits a short message, the short message is transmitted to a corresponding SC (Service Center) based on an SC address from the MS. Here, the SC address from the MS is a secret number of the SC. That is, the SC set up in the MS processes the message.

In this method, when an SMS (Short Message Service) provider and a core network provider are different, subscribers can select the SMS provider.

Referring to Fig. 1, when an SC address is designated as an SC number, if an MS 10 transmits a short message, it is transmitted to an MSC/SGSN/VLR 20 with the SC address stored in the MS 10 (S100).

The MSC/SGSN/VLR 20 transmits a message MAP_MO_FORWARD_SHORT_MESSAGE to an SMSC (Short Message Service Center) 30 having the SC address (S102). Here, the transmitted SC address is the SC number, and the MSC/SGSN/VLR 20 manages routing information of the corresponding SMSC 30 by SC numbers.

The SMSC 30 processes the short message, and outputs a message MAP_MO_FORWARD_SHORT_MESSAGE_ACK to the MSC/SGSN/VLR 20. The MSC/SGSN/VLR 20 outputs a short message response SHORT MESSAGE ACK to the MS 10 to notify that the short message has been successfully processed (S102 and S103).

However, when the SMS provider and the core network provider are identical, if the provider has a plurality of SC, a lot of messages may be centralized in a specific SMSC according to call habits of subscribers as shown in Fig. 2. That is, when the SC address means the secret number of the SC, the messages may not be evenly distributed to the SMSC. There is no way of distributing some subscribers of one SMSC to another SMSC, and thus SC reception ability is not predictable. It is also hard to actively cope with civil appeals and troubles.

Disclosure of Invention

An object of the present invention is to provide a method for processing an address of a short message service center in an IMT-2000 asynchronous network which can efficiently utilize the network by using a mobile station ISDN as a mobile switching center address stored in a mobile station defined in 3GPP for routing and subscriber distribution of the

short message service center, instead of using a real mobile switching center address.

In order to achieve the above-described object of the invention, there is provided a method for processing an address of a short message service center in a WCDMA network, including: a load centralization confirmation step where an operation control unit receives short message processing states from each short message service center, confirms load centralization states of each short message service center, and generates an operation message; a path setup step where a mobile switching center receives a short message from a mobile station, and sets up a transmission path of the short message according to the operation message; and an optimal transmission step where the mobile switching center transmits the short message from the mobile station to the corresponding short message service center through the transmission path according to the result of the path setup step.

Brief Description of the Drawings

Fig. 1 is a flowchart showing a conventional method for processing short message service transmission;

Fig. 2 is an exemplary diagram illustrating load centralization of a general short message service center;

Fig. 3 is a block diagram illustrating a network structure for processing a short message service which the present invention can be applied to;

Fig. 4 is an exemplary diagram illustrating a format of a destination

address transmitted to a mobile switching center in accordance with the present invention;

Fig. 5 is a flowchart showing a method for processing short message service transmission in accordance with the present invention;

Fig. 6 is an exemplary diagram illustrating routing from the mobile switching center to short message service centers based on MSIDSN in accordance with the present invention;

Fig. 7 is an exemplary diagram illustrating load concentration of the short message service center in accordance with the present invention; and

Fig. 8 is an exemplary diagram illustrating routing for subscriber distribution in load centralization in accordance with the present invention.

Best mode for Carrying Out the Invention

A method for processing an address of a short message service center in an IMT-2000 asynchronous network in accordance with the present invention will now be described in detail with reference to the accompanying drawings.

Fig. 3 is a block diagram illustrating a network structure for processing a short message service which the present invention can be applied to.

As illustrated in Fig. 3, the network structure is composed of an MS (Mobile Station) 10, an MSC/SGSN/VLR 20, a plurality of SMSC (Short Message Service Center) 30 linked to a plurality of MSC (Mobile Switching Center), HLR (Home Location Register), VMS/FMS (Voice Mail System/Fax

Mail System), IVR (Interactive Voice Response) and other SME (Short Message Entity), for providing a supplementary service for enabling mobile phone subscribers to transmit/receive short messages in the form of characters, and an operation control unit 40 for outputting an operation message to the MSC/SGSN/VLR 20 and controlling variations of a message transmission path according to real-time statistical data of short message processing states of each SMSC 30.

The operation of the present invention will now be explained.

Fig. 5 is a flowchart showing a method for processing short message service transmission in accordance with the present invention.

As depicted in Fig. 5, when an SC address is an MSISDN, if the MS 10 transmits a short message, it is transmitted to the MSC/SGSN/VLR 20 with the SC address stored in the MS 10 (S200). Here, the SC address is stored in an SIM (Subscriber Information Module) card of the MS 10. When the subscriber transmits the short message, the SC address is included in a DA (Destination Address) of RP (Release Protocol)-data, and transmitted to the MSC/SGSN/VLR 20 (S200). Fig. 4 shows a format of the DA.

As shown in Fig. 4, octet 1 denotes an intrinsic value of the DA (RP-data has IDs by parameters, and octet 1 shows an intrinsic ID of the RP-data), and octet 2 denotes a whole length of parameters. 1 ext of octet 3 always implies ' 1' , and type of number is generally international, national or unknown. Real numbers are used from octet 4.

The MSC/SGSN/VLR 20 transmits a message MAP_MO_FORWARD_SHORT_MESSAGE to the SMSC 30 having the corresponding SC address (S201). The SC address is the MSISDN of the subscriber.

Here, the MSC/SGSN/VLR 20 requires rooting information to decide which SMSC 30 it should transmit the message to by using the MSISDN. The operation control unit 40 receives the short message processing states from each SMSC 30 in the real time, and confirms load centralization of each SMSC (the SMSC processing a relatively small number of short messages is regarded as a minimum load centralization SMSC in the real time). When the SMSC shows load centralization, the operation control unit 40 transmits an operation message to the MSC/SGSN/VLR 20 in order to newly set up a short message transmission path to the minimum load centralization SMSC. Thus, the MSC/SGSN/VLR 20 has transmission path information (routing information).

The SMSC 30 processes the short message and outputs a message MAP_MO_FORWARD_SHORT_MESSAGE_ACK to the MSC/SGSN/VLR 20. The MSC/SGSN/VLR 20 outputs a short message response SHORT MESSAGE ACK to the MS 10 to notify that the short message has been successfully processed (S202 and S203).

Accordingly, when the SC address is the MSISDN, as shown in Fig. 6, the subscribers can be efficiently distributed to the SMSC 30 according to office data operations of the MSC/SGSN/VLR 20. That is, when SMSC call attempts are not balanced due to call habits of the subscribers, load can be reduced by changing routing information of some subscribers of the SMSC 30 (for example, by prefixes).

For example, the MSC/SGSN/VLR 20 performs SMSC routing by prefixes of subscribers as shown in Fig. 7. When load increases in SMSC1 due to call habits of the subscribers, some of the prefixes routed to SMSC1

are controlled to be routed to SMSC3 as shown in Fig. 8. As a result, load of SMSC1 is adjusted.

As the present invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, it should also be understood that the above-described embodiment is not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its spirit and scope as defined in the appended claims, and therefore all changes and modifications that fall within the metes and bounds of the claims, or equivalences of such metes and bounds are therefore intended to be embraced by the appended claims.

INDUSTRIAL APPLICABILITY

As described above, when a lot of messages are centralized to a specific SMSC due to call habits of subscribers, the method for providing the short message service in the WCDMA network distributes some subscribers of the SMSC to another SMSC, and thus SC reception ability is predictable. It is also possible to actively cope with civil appeals and troubles.

What is claimed is:

1. In a method for processing a short message in a mobile communication network including a mobile switching center for switching calls, a short message service center for providing a short message service, and an operation control unit for operating and managing the short message service center, a method for processing an address of a short message service center in a WCDMA network, comprising:

a load centralization confirmation step where the operation control unit receives short message processing states from each short message service center, confirms load centralization states of each short message service center, and generates an operation message;

a path setup step where the mobile switching center receives a short message from a mobile station, and sets up a transmission path of the short message according to the operation message; and

an optimal transmission step where the mobile switching center transmits the short message from the mobile station to the corresponding short message service center through the transmission path according to the result of the path setup step.

2. The method of claim 1, wherein the load centralization confirmation step comprises a step where the operation control unit receives the short message processing states from each short message service center, confirms a minimum load centralization short message service center according to real-time statistical data, and transmits the

operation message for requesting path setup variations to the mobile switching center, so that the minimum load centralization short message service center can process newly-transmitted short messages.

3. The method of claim 1, wherein, in the path setup step, the mobile switching center sets up the short message service center corresponding to address information included in the operation message from the operation control unit as a minimum load centralization short message service center to set up the transmission path of the short message, and in the optimal transmission step, the mobile switching center transmits the short message from the mobile station to the minimum load centralization short message service center through the transmission path.

4. The method of claim 2, wherein, in the load centralization confirmation step, the operation control unit decides the short message service center processing a relatively small number of short messages as the minimum load centralization short message service center in the real time according to the short message processing states from each short message service center.

FIG. 1

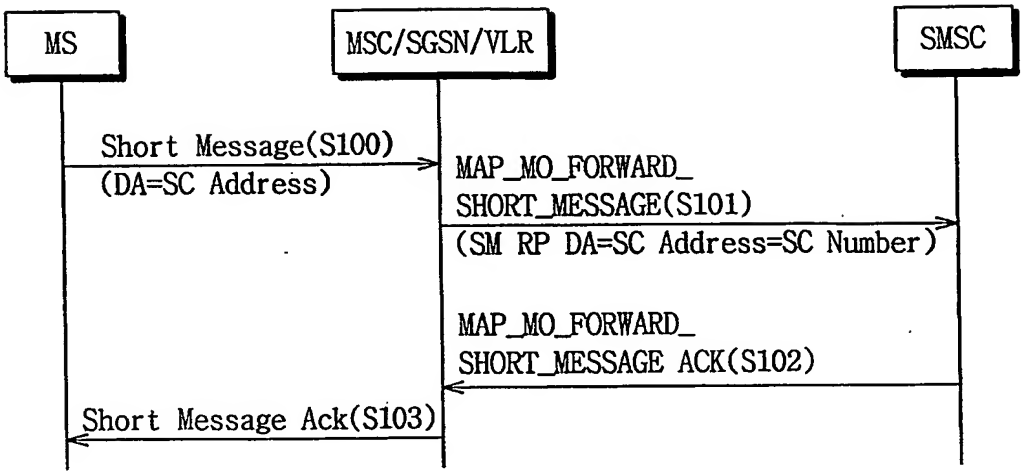

MS
MSC/SGSN/VLR
SMSC
Short Message(S100)
(DA=SC Address)
MAP_MO_FORWARD_
SHORT_MESSAGE(S101)
(SM RP DA=SC Address=SC Number)
MAP_MO_FORWARD_
SHORT_MESSAGE ACK(S102)
Short Message Ack(S103)

FIG. 2

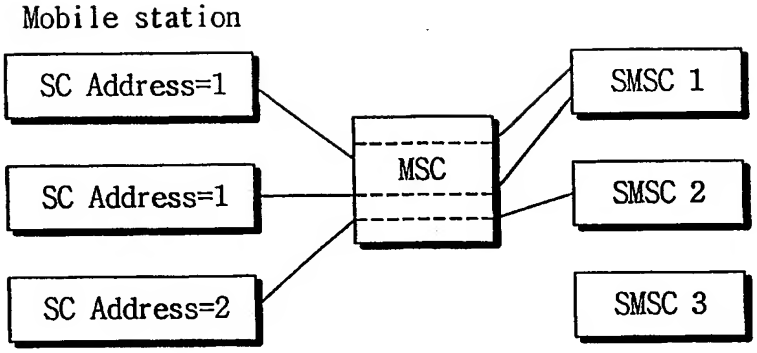

Mobile station
SC Address=1
SC Address=1
SC Address=2
MSC
SMSC 1
SMSC 2
SMSC 3

FIG. 3

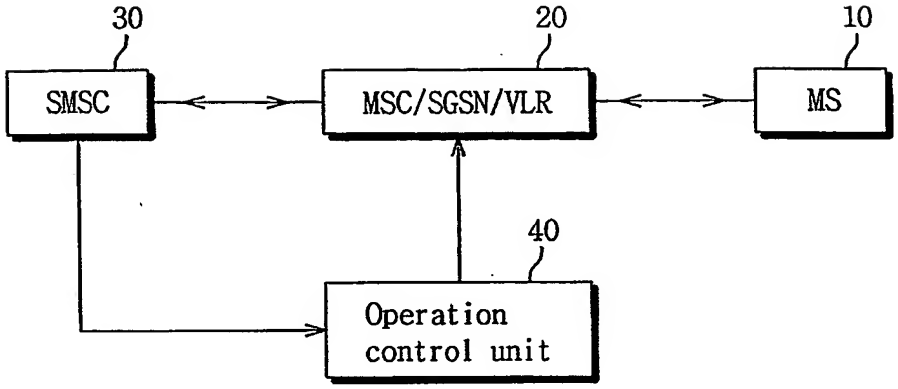


FIG. 4

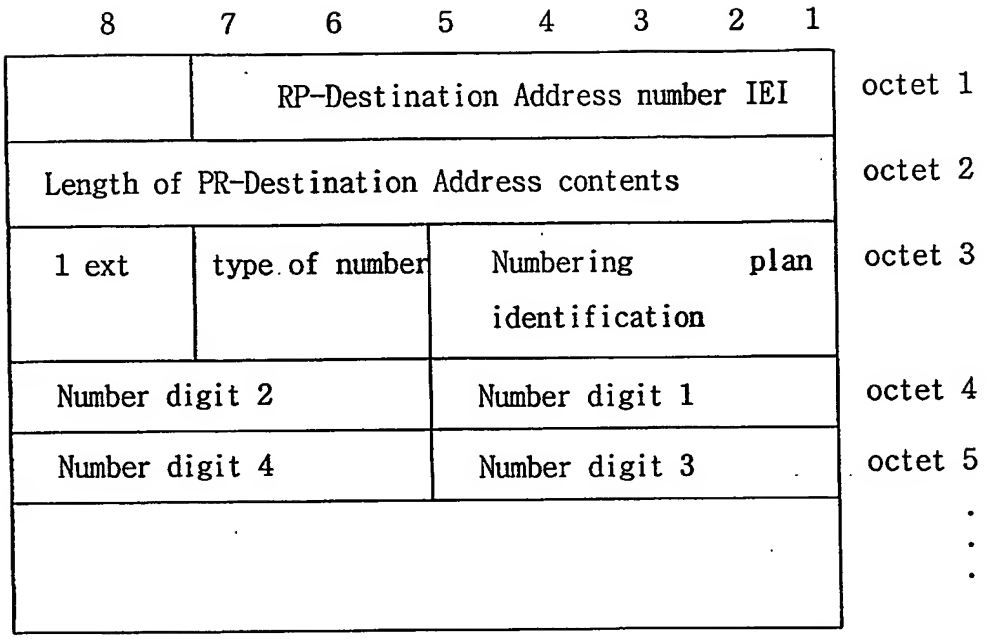

8 7 6 5 4 3 2 1
RP-Destination Address number IEI
octet 1
Length of PR-Destination Address contents
octet 2
1 ext
type of number
Numbering plan identification
octet 3
Number digit 2
Number digit 1
octet 4
Number digit 4
Number digit 3
octet 5

FIG. 5

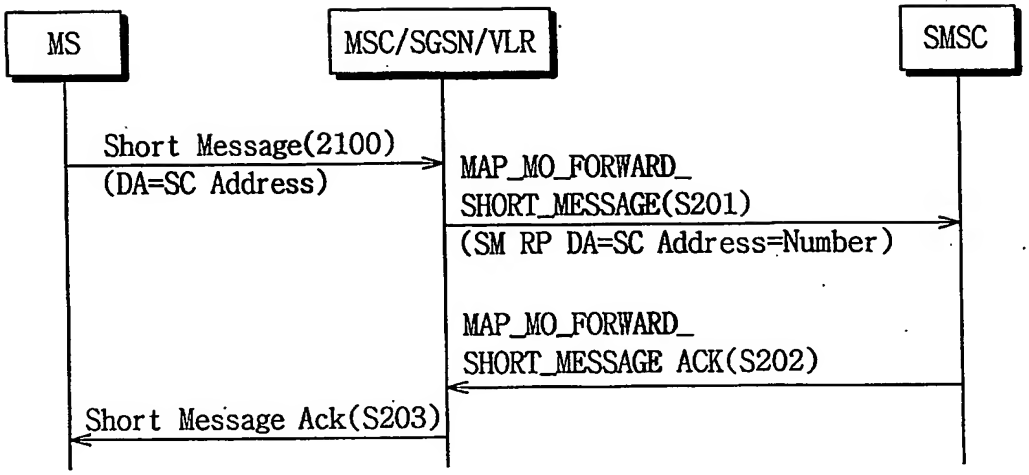

MS
MSC/SGSN/VLR
SMSC
Short Message(2100)
(DA=SC Address)
MAP_MO_FORWARD_
SHORT_MESSAGE(S201)
(SM RP DA=SC Address=Number)
MAP_MO_FORWARD_
SHORT_MESSAGE ACK(S202)
Short Message Ack(S203)

FIG. 6

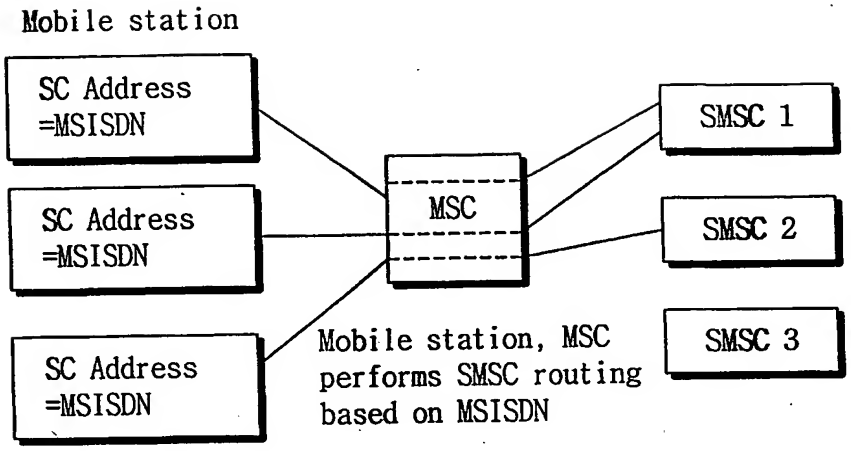

Mobile station
SC Address =MSISDN
SC Address =MSISDN
SC Address =MSISDN
MSC
SMSC 1
SMSC 2
SMSC 3
Mobile station, MSC performs SMSC routing based on MSISDN

FIG. 7

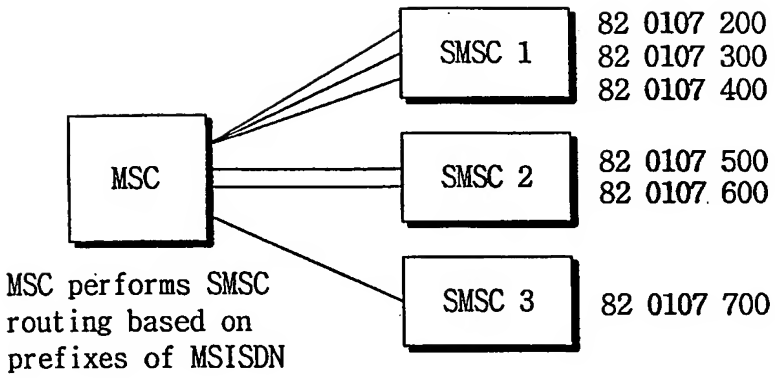
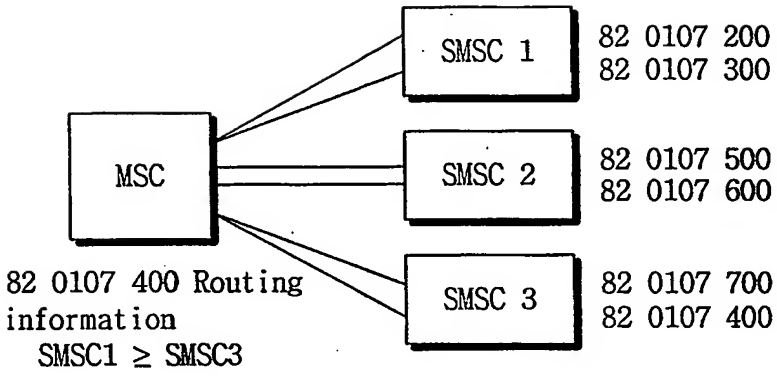

MSC
SMSC 1
SMSC 2
SMSC 3
82 0107 200
82 0107 300
82 0107 400
82 0107 500
82 0107 600
82 0107 700
MSC performs SMSC routing based on prefixes of MSISDN

FIG. 8


SMSC 1
82 0107 200
82 0107 300
MSC
SMSC 2
82 0107 500
82 0107 600
82 0107 400 Routing information
SMSC1 ≥ SMSC3
SMSC 3
82 0107 700
82 0107 400

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR03/00639

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 H04Q 7/20

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC7 H04Q7/20

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Patents and applications for inventions since 1975
Korean Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Korean Patent and Utility model search system

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1021056 A1 (LUCENT TECHNOLOGIES, INC) 19.JUL.2000 see the whole document.	1
A	WO 00/10294 A2 (PHONE.COM, INC) 24.FEB.2000 see the whole document	1
A	KR 2001-84294 A (HYNIX SEMICONDUCTOR, INC) 6.SEP.2001 see the whole document	1
A	KR1998-35956 A (ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE) 5.AUG.1998 see the whole document	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15 JULY 2003 (15.07.2003)	21 JULY 2003 (21.07.2003)
Name and mailing address of the ISA/KR Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer JEONG, Hae Kon Telephone No. 82-42-481-5986

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR03/00639

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1021056 A1	19.JUL.2000	US 6389298 B1	14.05.2002
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KR 2001-84294 A	6.SEP.2001		
KR 1998-35956 A	5.AUG.1998		